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09/871,805	06/04/2001	Shunpei Yamazaki	12732-049001	1978

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FISH & RICHARDSON P.C.
1425 K STREET, N.W.
11TH FLOOR
WASHINGTON, DC 20005-3500

EXAMINER	
DONG, DALEI	
ART UNIT	PAPER NUMBER
2875	

DATE MAILED: 09/05/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/871,805	YAMAZAKI, SHUNPEI	
	Examiner	Art Unit	
	Dalei Dong	2875	

-- The MAILING DATE of this communication appears on the cov r sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *29 August 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-52* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-52* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 June 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☒ Certified copies of the priority documents have been received in Application No. *09/871,805* .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 7 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1, 5-15 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,072,278 to Keyser in view of O'Brien et al. ("Improved Energy transfer in electrophosphorescent devices", Applied Physics Letters, 1999) in further view of Baldo et. al. ("Very high-efficiency green organic light-emitting devices based on electrophosphorescence", Applied Physics Letters, 1999).

Regarding to claim 1, 5-15 and 19, Keyser discloses in Figure 3, "an electroluminescent (EL) structure is shown and referred to generally as structure 100. A substrate 102 is provided for fabricating an increased capacitance EL pixel electrode structure. Substrate 102 is preferably silicon although other suitable materials are contemplated. Devices 107 for control circuitry as described above are included on a device layer 106 and include blocking transistors 130 (switching thin film transistor) and access transistors 132 (current control thin film transistor) (shown in FIG. 4)" (column 5, line 41-48).

Keyser also discloses in Figure 3, "an insulating layer 104 is formed on substrate 102 to isolate devices formed thereon from substrate 102. Insulating layer is preferably

formed from silicon dioxide or equivalent materials. Device layer 106 is formed on insulating layer 104. Device layer 106 is preferably silicon. Devices 107 include transistors or other semiconductor devices. Transistors and capacitors comprise the control circuitry for activating pixel electrode 116 as described above with reference to FIG. 2" (column 5, line 49-58).

Keyser further discloses in Figure 3, "a dielectric layer 126 is formed on device layer 106. A conductive layer 110 is deposited on dielectric layer 126. Conductive layer 110 forms a first electrode 108 for a hold capacitor 109. Electrode 108 connects to a gate of a blocking transistor 130 (FIG. 4) used to activate pixel electrode 116. Electrode 108 also connects to one end of access transistor 32 (FIG. 2). A high dielectric constant layer 124 is deposited over an entire surface of structure 100 on conductive layer 110 and another conductive layer 112 is formed on dielectric layer 124. A portion of conductive layer 112 forms a second electrode 111 of hold capacitor 109. In one embodiment, conductive layer 112 can function as a capacitor plate and/or a high voltage shield to protect controlling transistors from phosphor (EL) excitation signals. Conductive layer 112 connects to control circuitry, for example, a transistor source, such as blocking transistor 130 (FIG. 4) source to tie it to ground" (column 5, line 59-67 to column 6, line 1-8).

Keyser further yet discloses in Figure 3, "an interlevel dielectric layer 122 is deposited to isolate the control circuitry from pixel electrode 116. Dielectric layer 122 is then planarized using established chemical-mechanical polishing (CMP) or by providing a sacrificial layer and etching it back to provide a planarized surface for the formation of

additional layers as described hereinafter. Vias 114 and 1 15 connect a drain of blocking transistor 130 (FIG. 4) in device layer 106 to electrode 116" (column 6, line 9-16).

Keyser further yet discloses in Figure 3, "an electroluminescent stack 118 and a transparent electrode 120 are formed continuously across a surface of the structure 100. Electroluminescent stack 118 may include a dielectric layer above and below it to isolate electroluminescent layer 118 from pixel electrode 116 and transparent electrode 120, respectively. Electroluminescent stack 118 preferably includes zinc sulfide, strontium sulfide or organic materials. For organic materials, electroluminescent stack 118 does not include dielectric layers above and below it, instead an electron transport layer and a hole transport layer sandwich an organic electroluminescent layer" (column 6, line 17-27).

However, Keyser does not disclose different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element. O'Brien teaches triplet compound of PtOEP, however fails to teach a singlet compound. Baldo teaches a singlet compound of $Ir(ppy)_3$.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the triplet PtOEP electrophosphorescence material of O'Brien and the singlet $Ir(ppy)_3$ electrophosphorescent material of Baldo for the electroluminescent structure of Keyser in order to provide an electroluminscent display having a plurality of high-performance pixels with significantly enhanced bright color and contrast and further uniform the light intensity from each pixels.

3. Claims 2-4, 16-18 and 20-52 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 6,072,278 to Keyser in view of U.S. Patent No. 5,932,892 to Hseuh in further view of O'Brien et al. ("Improved Energy transfer in electrophosphorescent devices", Applied Physics Letters, 1999) and yet in further view of Baldo et. al. ("Very high-efficiency green organic light-emitting devices based on electrophosphorescence", Applied Physics Letters, 1999).

Regarding to claims 2, 16 and 20-30, Keyser discloses an EL structure comprising a pixel portion; a switching thin film transistor in the pixel portion; a current control thin film transistor in the pixel portion; an EL element electrically connected to the current control thin film transistor in the pixel portion.

However, Keyser does not disclose the switching thin film transistor is a p-channel thin film transistor and the current control thin film transistor is an n-channel thin film transistor; and different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element.

Hseuh teaches in Figure 1, "The transistors used to form the switching circuit 106 may be of any one of a number of designs. Typically, the first transistor is a low breakdown voltage (less than 10 volts) MOS transistor. The second transistor is typically a double diffused MOS (DMOS) device having a high breakdown voltage (greater than 150 volts). The transistors can be either n- or p-channel devices or a combination thereof, e.g., two NMOS transistors, two PMOS transistors or a combination of NMOS and PMOS transistors" (column 3, line 13-21).

However, Hseuh fails to teach different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element. O'Brien teaches triplet compound of PtOEP, however fails to teach a singlet compound. Baldo teaches a singlet compound of $Ir(ppy)_3$.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the triplet PtOEP electrophosphorescence material of O'Brien and the singlet $Ir(ppy)_3$ electrophosphorescent material of Baldo for the electroluminescent structure of Keyser and construct the switching and controlling thin film transistor of Keyser using either n-channel or p-channel interchangeably according to Hseuh in order to provide an electroluminscent display having a plurality of high-performance pixels with significantly enhanced bright color and contrast and thus uniform the light intensity from each pixels and furthermore, eliminate the error in activation display device and upgrade the controllability of the display device.

Regarding to claims 3, 17 and 31-41, Keyser discloses an EL structure comprising a pixel portion; a switching thin film transistor in the pixel portion; a current control thin film transistor in the pixel portion; an EL element electrically connected to the current control thin film transistor in the pixel portion.

However, Keyser does not disclose the switching thin film transistor is a n-channel thin film transistor and the current control thin film transistor is an n-channel thin film transistor; and different pixel of the EL structure emitting different color of light and

wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element.

Hseuh teaches in Figure 1, "The transistors used to form the switching circuit 106 may be of any one of a number of designs. Typically, the first transistor is a low breakdown voltage (less than 10 volts) MOS transistor. The second transistor is typically a double diffused MOS (DMOS) device having a high breakdown voltage (greater than 150 volts). The transistors can be either n- or p-channel devices or a combination thereof, e.g., two NMOS transistors, two PMOS transistors or a combination of NMOS and PMOS transistors" (column 3, line 13-21).

However, Hseuh fails to teach different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element. O'Brien teaches triplet compound of PtOEP, however fails to teach a singlet compound. Baldo teaches a singlet compound of $Ir(ppy)_3$.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the triplet PtOEP electrophosphorescence material of O'Brien and the singlet $Ir(ppy)_3$ electrophosphorescent material of Baldo for the electroluminescent structure of Keyser and construct the switching and controlling thin film transistor of Keyser using either n-channel or p-channel interchangeably according to Hseuh in order to provide an electroluminscent display having a plurality of high-performance pixels with significantly enhanced bright color and contrast and thus

uniform the light intensity from each pixels and furthermore, eliminate the error in activation display device and upgrade the controllability of the display device.

Regarding to claims 4, 18 and 42-52, Keyser discloses an EL structure comprising a pixel portion; a switching thin film transistor in the pixel portion; a current control thin film transistor in the pixel portion; an EL element electrically connected to the current control thin film transistor in the pixel portion.

However, Keyser does not disclose the switching thin film transistor is a p-channel thin film transistor and the current control thin film transistor is an p-channel thin film transistor; and different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element.

Hseuh teaches in Figure 1, "The transistors used to form the switching circuit 106 may be of any one of a number of designs. Typically, the first transistor is a low breakdown voltage (less than 10 volts) MOS transistor. The second transistor is typically a double diffused MOS (DMOS) device having a high breakdown voltage (greater than 150 volts). The transistors can be either n- or p-channel devices or a combination thereof, e.g., two NMOS transistors, two PMOS transistors or a combination of NMOS and PMOS transistors" (column 3, line 13-21).

However, Hseuh fails to teach different pixel of the EL structure emitting different color of light and wherein a triplet compound is used in the first EL element while a singlet compound is used in the second and third EL element. O'Brien teaches

triplet compound of PtOEP, however fails to teach a singlet compound. Baldo teaches a singlet compound of $Ir(ppy)_3$.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to have utilize the triplet PtOEP electrophosphorescence material of O'Brien and the singlet $Ir(ppy)_3$ electrophosphorescent material of Baldo for the electroluminescent structure of Keyser and construct the switching and controlling thin film transistor of Keyser using either n-channel or p-channel interchangeably according to Hseuh in order to provide an electroluminscent display having a plurality of high-performance pixels with significantly enhanced bright color and contrast and thus uniform the light intensity from each pixels and furthermore, eliminate the error in activation display device and upgrade the controllability of the display device.

Response to Arguments

4. Applicant's arguments filed August 29, 2003 have been fully considered but they are not persuasive.

In response to applicant's argument that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988)and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Keyser reference discloses

an active matrix electroluminescent display device and O'Brien reference and Baldo reference teaches different type of well known electroluminescent materials used in a electroluminescent display device, it would have been obvious to one having ordinary skill in the art at the time the invention was made to have utilize different electroluminescent material in an electroluminescent display device in order to obtain the desired characteristics of the display. Further, it is old and well known in the art to utilize different type of electroluminescent material to generate light beam with different wavelength in different pixels of a single electroluminescent display device and furthermore it is the intrinsic property of different electroluminescent materials to emit light beam with different wavelength, therefore it would have been obvious to utilize different types of electroluminescent materials in one single electroluminescent display device in order to obtain the desired light beam with desired wavelength for the viewing pleasure. Thus, Examiner asserts that the combination of Keyser reference in view of O'Brien reference in further view of Baldo reference is valid and maintains the rejection.

Conclusion

5. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dalei Dong whose telephone number is (703)308-2870. The examiner can normally be reached on 8 A.M. to 5 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sandra O'Shea can be reached on (703)305-4939. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703)308-0956.

D.D.
September 4, 2003

Sandra O'Shea
Supervisory Patent Examiner
Technology Center 2800